



ENSAFE INC.

ENVIRONMENTAL AND MANAGEMENT CONSULTANTS

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April 21, 2000

Florida Department of Environmental Protection  
Attn: Joe Fugitt  
Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Re: Final Remedial Investigation Report Errata Pages,  
Site 40 (Operable Unit 15), NAS Pensacola  
Contract # N62467-89-D-0318/036

Dear Mr. Fugitt:

On behalf of the Navy, EnSafe Inc. is pleased to submit two copies of the Final Remedial Investigation Report Errata Pages for Site 40 (Operable Unit 15), Bayou Grande at the Naval Air Station Pensacola in Pensacola, Florida. Responses to FDEP comments are also enclosed. EPA and NOAA comment responses are provided in the NAS Pensacola Tier 1 Partnering Team Meeting Minutes of February and August 1999.

If you should have any questions or need any additional information regarding the document, please do not hesitate to call me.

Sincerely,

EnSafe Inc.

A handwritten signature in cursive script that reads "Allison L. Harris".

Allison L. Harris  
Task Order Manager

Enclosure

cc: Tom Lubozynski, FDEP - NW District without enclosure  
Bill Hill, Code 1851 SOUTHNAVFACENGCOM without enclosure  
EnSafe Inc. file without enclosure  
EnSafe Inc. Knoxville file without enclosure  
EnSafe Inc. library without enclosure  
Terry Hansen, TetraTech NUS Administrative Record without enclosure

**Florida Department of Environmental Protection**  
**Response to Comments**  
**Final Remedial Investigation Report for Site 40**  
**NAS Pensacola**

**Ecological Baseline Risk Assessment (Section 10.2)**

The Ecological BRA prepared by EnSafe is generally consistent with ecological risk assessment guidance from the USEPA. For purposes of the risk assessment, Site 40 was divided into 4 Assessment Zones (AZs). The boundaries of these AZs are artificial but serve to delineate areas that may have been impacted by similar base-related activities. The characterization of Site 40 took place in several phases. In Phase I, sediment at Site 40 was analyzed for grain size and total organic carbon content. These data were used in the Phase IIA sampling in an effort to focus sample collection to those locations which had a greater potential for the accumulation of chemical contaminants. In Phase IIB/III, sediment samples were taken at 10 locations across Site 40. These samples were used to assess sediment quality using a Sediment Quality Triad (SQT) approach which included: 1) determination of the levels of contaminant present, 2) determination of the potential for toxicity and bioaccumulation in the food chain, and 3) an analysis of the benthic community structure. From the risk assessment, EnSafe concluded that while elevated hazard quotients based on the ratio of measured contaminant levels with sediment screening levels (SSLs) indicated some risk to ecological receptors, results of the SQT analysis demonstrated that ecological receptors are not at risk from contaminants located at the site. This conclusion seems reasonable given the data presented in the report. However, we have identified several areas of concern with the ecological BRA:

**Comment 1:**

Section 7 of the RI Report contains detailed sampling data for chemicals at Site 40. Tables 7-1 through 7-3 present the analytes detected at Site 40, the detection frequency, the range of detected values, and a comparison to SSLs. There are a number of contaminants for which no SSL was available. On this basis, it appears that these contaminants were eliminated from further evaluation (i.e., they are not presented or discussed in Section 10). Normally, screening values are used to "screen out," rather than as a basis to include, chemicals as COPCs, and the absence of a screening value would lead to the continued inclusion of a chemical in the risk assessment. In this Particular case, omission of these chemicals does not appear to have compromised the risk assessment, as toxicity bioassays and benthic community analyses conducted for Site 40 indicate that the sediment is relatively "healthy."

**Response:**

**Agreed.**

**Comment 2:**

When tissue from fish collected at Site 40 was analyzed for contaminants, neither total mercury or methyl mercury was included as a target analyte. Given the fact that mercury is present at

concentrations that **exceed** the SSL, the transfer of this contaminant to higher trophic levels in the food chain should be evaluated,

**Response:**

**Agreed.** A model was performed which predicts mercury tissue concentration in the red drum (*Sciaenops ocellatus*) based on concentrations of mercury in the sediment of Site 40. This model is based on a mercury bioaccumulation model developed by NOAA (Evans and Engel, 1994) and is presented in Attachment A of the RI Report Addendum.

**Comment 3:**

Fish tissue samples collected at Site 40 are limited in nature. This affects the conclusions of the risk assessment in a number of ways. Section 5.2 explains that fish were collected over several days at only one location and that composite samples of 2 representative species of foraging fish (Pinfish and killifish) were analyzed for contaminant concentrations. Four individual killifish and nine individual pinfish were included in the respective composite samples. Contaminant levels in higher trophic level fish were not measured, but rather were modeled based on the results in the few foraging fish that were analyzed. The ability of this approach to adequately assess contaminant burdens in fish, important both for the stated goal of "protecting fish viability" and for the human health risk assessment is highly questionable. Without additional sampling of fish, including fish at higher trophic levels, this represents a significant weakness in the ecological risk assessment.

**Response:**

The fish model uses various inputs to conservatively estimate risk to upper trophic level fish (maximum and mean detected concentrations in prey fish, site foraging factors of 1 and 0.32, and lowest and no adverse effects levels from the ERED database (U.S. Army Corp of Engineers, 2000). A Level 4 fish that is important economically is the red drum, and is used in the mercury model and would be representative of the Level 4 species of interest in the fish model. Red drum are dependent on estuaries for at least the first few years of life. Larvae and juveniles are generally found in shallow waters, in areas not greatly affected by tides, with grassy or muddy bottoms and moderate salinities. Adult red drum move out to nearshore ocean waters and only come back to the estuaries to spawn. For the purposes of the risk assessment, red drum were assumed to spend all of their life in Bayou Grande, thereby overestimating the risk since adult fish would likely spend the majority of time in nearshore ocean waters and only coming back to Bayou Grande to spawn (i.e., exposure to contaminants in the sediments of Site 40 would only be constant during the first few years of life, with the adult red drum only being exposed during periods of spawning). The model predicting the tissue concentration in the Level 4 fish assumes that the red drum is feeding only on prey within Bayou Grande, when in reality, the adult red drum would be feeding primarily on prey from Pensacola Bay and the Gulf of Mexico. Therefore, it would be difficult to assess the source of contaminants detected in the fish tissue.

In addition, many gamefish feed on other food sources besides fish. For example, red drum are major predators in estuaries with prey consisting primarily of crustaceans (crabs and shrimp) and other fish. Fish are generally more prevalent in the diet of red drum during winter and spring months, and crustaceans become increasingly more important during late spring and summer. Therefore, the estimated risk may be overestimated because these other food sources may not bioaccumulate COPCs at the same rate as the trophic Level 3 fish (Pinfish and killifish) that were used as the basis for predicting concentrations of COPCs in trophic Level 4 fish. As a result, the amount of contaminant ingested by the Level 4 fish may vary with the season and prey species available,

Significant number of red drum would need to be collected from Bayou Grande in order to obtain a realistic estimate of the average tissue concentration of the contaminants in that fish species. Additionally, even if this data were collected, there is limited toxicity information available specifically for the red drum for the compounds of concern for comparison purposes. Given the other conservative assumptions utilized in the model, it is believed that collection of additional fish tissue samples is not warranted at this time.

#### Human Health Risk Assessment (Section 10.3)

For the human health portion of the Site 40 BRA, EnSafe evaluated four potential exposure scenarios, an adolescent swimmer, an adult swimmer, an adult commercial worker (lifeguard), and a recreational fisher. Due to the limited nature of human contact with Site 40, these seem to be reasonable scenarios for evaluation. However, because of several shortcomings in data collection and exposure pathway evaluation, we are concerned that characterization of human health risks from Site 40 are inadequate. Specifically:

##### **Comment 1:**

A portion of Site 40 is apparently used for recreational swimming. It is unclear from the information provided how well contamination in this area has been characterized. Additional description and discussion of contamination assessment in areas currently or likely to be used for recreational activities such as swimming needs to be added to the report. It is possible that soil and near shore sediment contamination levels have not been adequately defined, in which case additional sampling would be warranted.

##### **Response:**

Surface soil has been sampled during individual site investigations at NAS Pensacola. Risk assessments were included in each of the site-specific remedial investigation reports. Therefore, additional sampling is not needed.

##### **Comment 2:**

On page 10-93, the equation used to calculate the preliminary remediation goals (PRGs) for the adolescent/adult recreational swimmer and the lifeguard is shown. The pathways of exposure to

contaminants at Site 40 by these receptors are limited to surface water ingestion and dermal contact. Dermal contact and ingestion of sediment by these receptors is considered by EnSafe to be insignificant pathways at Site 40. Children playing in the near shore areas *will* come in contact with and probably ingest some sediment. Therefore, this exposure pathway should be evaluated.

**Response:**

**As stated in the response to Comment 1, surface soil has been sampled during individual site investigations at NAS Pensacola. Risk assessments were included in each of the site-specific remedial investigation reports.**

**Comment 3:**

Risk estimates to recreational anglers at Site 40 were calculated using the ratio of the Region III RBCs for fish ingestion and the maximum tissue concentration of contaminants in prey fish (Pinfish and killifish). The results of this calculation are displayed in Table 10-37, Cumulative cancer risk is estimated to be  $7.4\text{E-}05$ . When modeled tissue concentrations in predatory fish that anglers would actually consume were compared to the Region III RBCs, cumulative risk was estimated to be  $5.6\text{E-}04$ . These values are greater than the **excess** cancer risks generally accepted by FDEP. These values are calculated using a fish ingestion rate of 59 g/day based on a native American subsistence fisher, which may not be applicable at this site. The Exposure Factors Handbook lists a 95<sup>th</sup> percentile fish ingestion value of 26 g/day for recreational anglers on the Gulf Coast, which should be considered as an alternative, conservative estimate of fish ingestion rate. The greatest uncertainty with these risk estimates, however, lies in the estimates of contaminant levels in fish. This uncertainty could be reduced by actual measurement of contaminant levels in game fish through sampling.

**Response:**

**The Remedial Investigation Report Addendum has provided a more detailed assessment of human health risk from fish ingestion.**